REMARKS

Claims 1-7 were pending in this application, of which claims 1, 3, 4, 5, and 7 have been amended and claim 2 has been canceled. Claims 8-10, newly added, are patentable for the reasons below. Thus, claims 1 and 3-10 stand for consideration in this application.

In response to the official action:

[2] The Examiner says that reference AK, 01120954.0 German Abstract, listed on the Form PTO-1449 submitted with our IDS, was not considered because it lacks a date.

Reference AK is not actually prior art, so consideration is not needed. From the Applicants' file it appears that the German Abstract is actually the Abstract of an EPO application corresponding to this application, and that the IDS of September 12, 2001 cited it through clerical error. The Applicants apologize for any confusion their error caused the PTO.

[3] The Examiner required that Figs. 10-11 be labeled as "prior art." A proposed drawing change, adding "prior art" to those figures, is attached. No new matter is added.

[4] The disclosure was objected to for informality, and is corrected.

[5-6] Claims 1-7 were rejected under 35 U.S.C. §112, second paragraph, as being indefinite. The claims are amended in view of the Examiner's remarks. Withdrawal of the rejection is requested.

[7-8] Claims 1 and 3 were rejected under 35 U.S.C. §103 as being unpatentable over the admitted prior art in view of Manabu (JP 2-287263). This rejection is moot but is respectfully traversed in view of the new claims.

The Examiner states (first full paragraph on page 4 of the Office Action) that the admitted prior art does not disclose a speed detection disk with a concave or a convex. The Examiner applies Manabu for the concave or convex parts.

New claim 8 recites "a pair of displacements on the planar surfaces, the displacements comprising one concave and one convex" (34 and 35, shown in Figs. 2A and 2C).

The one concave and the one convex produce pulses of opposite phase (as shown in Figs. 4A-4B) and their signals can be added in adder 42 (Fig. 3) or subtracted in subtractor 42, producing either a zero output (Fig. 4C) or a double-height pulse output (Fig. 4D and page 12, line 46). This permits the axial-displacement measure and the rotating-speed measure to be detected *independently* (page 8, lines 5-8), and it eliminates the need for separate axial-displacement detectors and the rotating-speed detectors (page 14, lines 18-28).

Manabu does not disclose this feature or its advantage. Manabu discloses only two concave displacements (Fig. 2) or two convex displacements (Fig. 4).

New claims 9 and 10 depend from claim 8 and further distinguish over Manabu.

[9] The subject matter of claims 2 and 4-7 was deemed allowable. These claims are formally amended and allowance is requested.

Any other fees which may be due with respect to this paper may be charged to Deposit Account No. 01-2340. Favorable consideration and allowance are respectfully solicited.

Respectfully submitted,

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Enclosure: Version With Markings to Show Changes
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VERSION WITH MARKINGS TO SHOW CHANGES

IN THE SPECIFICATION

Paragraph starting at line labeled 5 on page 1:

The present invention relates to a magnetic levitation rotating machine which performs levitation support control of a rotator, provided with a magnetic material as an object to be controlled, so [as for] that the rotator [to be] is supported in a levitated state at a desired position in a noncontact manner through the utilization of magnetic attraction force or magnetic repulsion force generated by an electromagnet or a permanent magnet. More particularly, the present invention relates to a detection mechanism for detecting the axial displacement and the rotating speed of the rotator.

IN THE CLAIMS

1. (Amended) A magnetic levitation rotating machine comprising:

a rotator;

an electromagnet or a permanent magnet [for] supporting [a] the rotator in a levitated state by a magnetic force of [an] the electromagnet or [a] the permanent magnet; [, said magnetic levitation rotating machine comprising:]

the rotator comprising a position detection [plane provided in the rotator and] planar surface further comprising a concave and/or a convex provided in the [plane] planar surface;

a displacement sensor [provided] on a fixed [side, for detecting] part of the machine, to detect a displacement of the [plane] planar surface including the concave or the convex; and

a detection mechanism [for] detecting the displacement of the rotator and a rotating speed of the rotator from an output of the displacement sensor;

wherein the displacement of the rotator is detected by extracting, from the output of the displacement sensor, the displacement of the planar surface with the component representing the concave or the convex being removed therefrom.

3. (Amended) The magnetic levitation rotating machine according to claim [1,] 4, wherein the rotating speed of the rotator is detected by extracting, from the output of the displacement sensor, a pulse output corresponding to the concave or the convex.

4. (Amended) [The magnetic levitation rotating machine according to claim 1,]

A magnetic levitation rotating machine comprising:

a rotator;

an electromagnet or a permanent magnet supporting the rotator in a levitated state by a magnetic force of the electromagnet or the permanent magnet;

the rotator comprising a position detection planar surface further comprising a concave and/or a convex provided in the planar surface;

a displacement sensor on a fixed part of the machine, to detect a displacement of the planar surface including the concave or the convex; and

a detection mechanism detecting the displacement of the rotator and a rotating speed of the rotator from an output of the displacement sensor;

wherein at least one pair of the displacement sensors is disposed at an arbitrary angle to the center of rotation of the rotator;

the detection [plane] planar surface is disposed so as to face the displacement sensors;

the concave and/or the convex [are] is disposed so as to correspond to the positions of the displacement sensors at the [same angle as the] arbitrary angle [, at which the displacement sensors are disposed,] to the center of rotation of the [plane;] rotator;

and

the position displacement and rotating speed of the detection [plane] planar surface are computed from the outputs of the at least one pair of the displacement sensors and are output to detect the displacement of the rotator and the rotating speed of the rotator.

5. (Amended) [The magnetic levitation rotating machine according to claim 1,]

A magnetic levitation rotating machine comprising:

a rotator;

an electromagnet or a permanent magnet supporting the rotator in a levitated state by a magnetic force of the electromagnet or the permanent magnet;

the rotator comprising a position detection planar surface further comprising a concave and/or a convex provided in the planar surface;

a displacement sensor on a fixed part of the machine, to detect a displacement of the planar surface including the concave or the convex; and

a detection mechanism detecting the displacement of the rotator and a rotating speed of the rotator from an output of the displacement sensor;

wherein the detection [plane] planar surface of the rotator is [disposed in] comprised of a thrust disk formed of a magnetic material, which is an object to be controlled by an electromagnet for axial levitation position control [, provided in the rotator].

7. (Amended) The magnetic levitation rotating machine according to claim 5, wherein the displacement sensors are each disposed [in] outside of the axial electromagnet.